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A R S
SCIENCE
HALL
OF
FAME

September 24, 1997

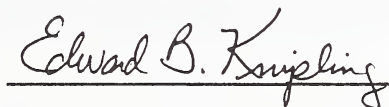
Agricultural Research Service
United States Department of Agriculture

Agricultural Research Service Science Hall of Fame

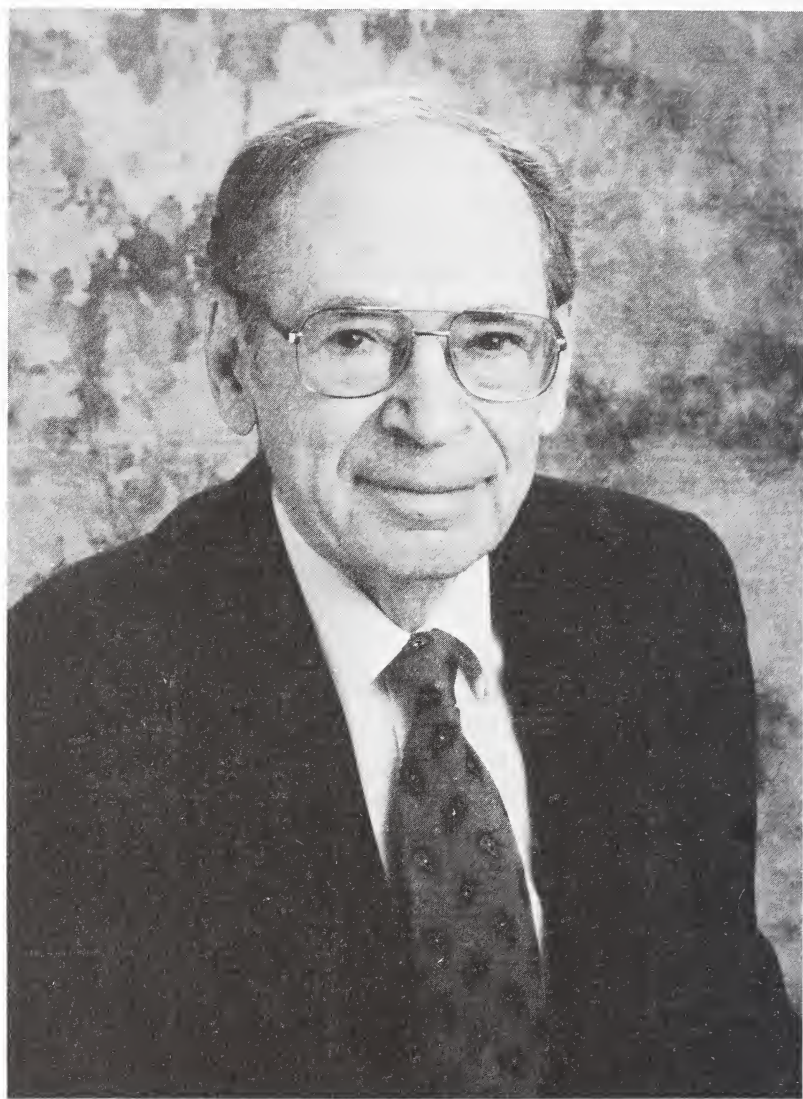
The ARS Science Hall of Fame was inaugurated in 1986. We determined that each succeeding year, one or more present or former scientists with the Agricultural Research Service could be selected, subject to the following criteria:

- The selectee made a major impact on agricultural research, either by the solution of a significant agricultural problem through research or by providing outstanding leadership that significantly advanced agricultural research.
- The selectee is a person whose accomplishments are still recognized by the agricultural research community.
- The selectee's character and record of achievement are worthy of emulation by younger agricultural scientists.
- The selectee's achievements must be or have been nationally and/or internationally recognized by peers in the scientific community.

Today we honor several outstanding scientists by inducting them into the Science Hall of Fame. A plaque citing the achievements of each will be on permanent display in the ARS National Visitor Center at the Beltsville Agricultural Research Center.

A handwritten signature in dark ink, reading "Edward B. Knipling". The signature is fluid and cursive, with a horizontal line drawn underneath the name.

Edward B. Knipling
Acting Administrator



1997

Morton Beroza

Chief (Retired)

Organic Chemicals Synthesis Laboratory
Beltsville, Maryland

For major contributions to the development of environmentally compatible insect control strategies through discovery of lures, attractants, repellents, and pheromones.

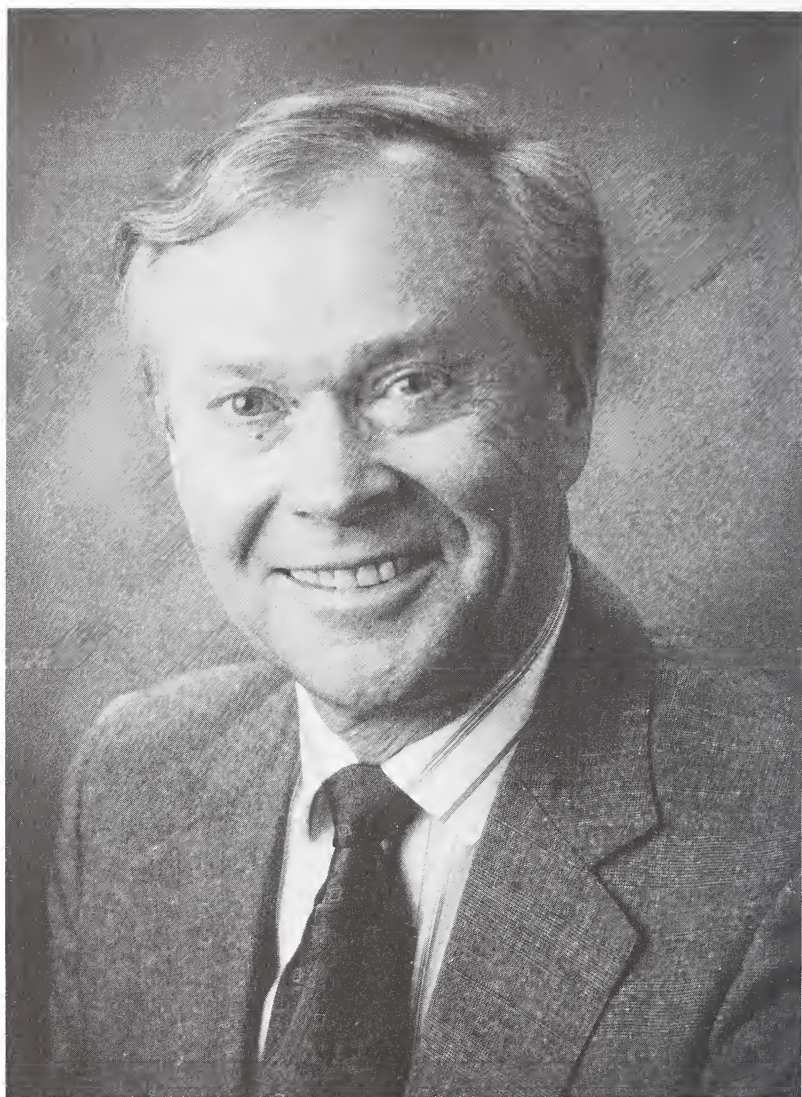
Morton Beroza has an international reputation for discovering ingenious and inventive tools for controlling insect pests safely within their ecological domain. He developed pest-control strategies that used chemicals that do not linger in the environment. His scientific legacy influences insect-pest-management programs of Federal, state, local, and international agencies.

Beroza revolutionized and inspired research worldwide with his discovery of the gypsy moth pheromone, or sex attractant. Disparlure is now used as the bait to trap male gypsy moths in more than 400,000 traps each year in the United States. The traps detect the presence of the chewing pest that defoliates an average of 3.3 million acres of hardwood trees per year.

Recognizing that multiplying in massive numbers can be an insect species' best survival strategy, Beroza was the first to propose using sex pheromones to confuse and disrupt mating. Farmers now use this confusion tactic to protect apples, cotton, corn, and other crops from some insect pests.

He also developed trimedlure, TML, for detecting the destructive Mediterranean fruit fly. Today, TML is used to bait medfly detection traps wherever fruit is grown. In the U.S., such traps help protect over \$4 billion of agricultural commodities. To help fight the latest outbreak of medfly in Florida, officials distributed 17,000 traps baited with TML. Beroza also discovered or contributed to the development of other attractants used to trap melon flies, Japanese beetles, house flies, fire ants, corn earworm, and many other pests.

Beroza invented analytical techniques and apparatus now used by chemists around the world. In many of his 315 scientific papers, he advanced such tools to unlock the secrets of more than 100 pesticides and pest-control chemicals. He also received three USDA Superior Service Awards and seven USDA Certificates of Merit. Among his many other professional honors were the American Chemical Society (ACS) National Award in Chromatography and Electrophoresis, the Harvey W. Wiley Award in Analytical Chemistry, and the ACS International Award for Research in Pesticide Chemistry.



1997

R. James Cook

Research Leader

Root Disease and Biological Control Research Unit

Pullman, Washington

For extraordinary research on sustainable approaches to improve wheat health and for leadership in the transfer of information and technology resulting in solutions to agricultural problems.

For more than 30 years, James Cook has inspired an ecological approach to controlling diseases of agricultural crops. In 1974, Cook coauthored the first book on the biological control of plant pathogens, followed by a second in 1983. He is recognized worldwide as the leading authority.

Early in his career, Cook led experiments that revealed a critical connection between *Fusarium* root rot thriving on wheat, soil too low in moisture, and excess nitrogen fertilizer. The revelation led to a breakthrough in water and soilborne plant disease study and resulted in a new, effective *Fusarium*-control plan for farmers.

Cook properly diagnosed that if farmers use "no-tillage" methods to sow wheat into the stubble of the previous wheat crop, three major diseases can take a big bite out of the coming crop. It was a visionary study that refined wheat health management.

Cook's newest findings are genetic sources of resistance to root diseases of wheat and barley. He is the first person to find resistance to both "take all" and *Rhizoctonia* root rot diseases in a plant closely related to wheat.

In 1988, Cook led a team of scientists from ARS, Washington State University, and Monsanto in the first field release of an ARS genetically engineered microorganism. Throughout his career, Cook has emphasized teamwork, solving problems with partnerships of farmers and scientists of many disciplines and agencies.

With a grasp of both biotechnology and practical problems faced by farmers, Cook was a highly effective Chief Scientist of the National Research Initiative Competitive Grants Program, the primary source of competitive funding for agricultural sciences. Cook is a member of the National Academy of Sciences. He has received both the USDA Superior Service Award and the Distinguished Service Award. He was named Distinguished ARS Scientist of the Year in 1985. He received the Award of Distinction, presented only ten times in the 80-year history of the American Phytopathological Society (APS), and was also co-recipient of the Ruth Allen Award--the highest research award of the APS.



1997

William L. Ogren

Plant Physiologist (Retired)
Photosynthesis Research Unit
Urbana, Illinois

For outstanding leadership and fundamental contributions to photosynthetic carbon metabolism leading to the discovery of new opportunities to improve the efficiency and productivity of crop plants.

William L. Ogren is a true pioneer in discovering how plants use sunlight. His achievements helped illuminate research on photosynthesis to make it a key factor worldwide for crop improvement strategies.

Ogren's elegant experiments revealed dark secrets of how green plants use the sun-driven process of photosynthesis to produce food, fiber, and energy for all life on Earth. As a member of a community of scientists trying to fortify the process in crops, Ogren showed how the enzyme rubisco initiates photosynthesis.

He showed that rubisco also starts an antiphotosynthesis process called photorespiration, which interferes with photosynthesis, slowing it by up to 40 percent. Ogren's research group demonstrated that the interference varies in different plants. This finding spawned a worldwide research movement tinkering with rubisco efficiency to improve crop productivity. The group also found rubisco is, in turn, regulated by another protein they named rubisco activase. The discovery added to a remarkable molecular and genetic dissection of photosynthesis.

To perform such dissecting, they introduced a botanical "guinea pig" that transformed modern plant biological research. Ogren and then-postdoctoral associate Chris Sommerville adopted *Arabidopsis*, because of its small, neat gene pool. During the past decade, the little weed has helped scientists make every major advance in plant sciences. For example, *Arabidopsis* is the central subject of the ARS Plant Genome Research Program in which scientists are making a detailed map of the gene structure of plants.

Ogren is a member of the National Academy of Sciences (NAS) and the American Academy of Arts and Sciences. He has received an Alexander von Humboldt Award for outstanding contributions to American Agriculture, the Crop Science Award, and the C.F. Kettering Award, and is a Fellow of the American Society of Agronomy and former President of the American Society of Plant Physiologists.

ARS Science Hall of Fame

1986

Edward F. Knipling

For pioneering research and leadership in development of the sterile insect technique, which led to the eradication of the screwworm, and of other technologies to suppress and manage insect pests.

1987

Howard L. Bachrach

For pioneering research on the molecular biology of foot-and-mouth disease that led to development of the world's first effective subunit vaccine for any disease of animals or humans through the use of gene splicing.

Myron K. Brakke

For consistent, career-long valuable contributions to the science of virology, particularly plant virology.

Glenn W. Burton

For outstanding achievements in forage and turf science, which have had extraordinary effects on the forage-based cattle industry, the turf industry, and agriculture worldwide.

Wilson A. Reeves

For outstanding research and leadership in the field of textile chemical finishing that have significantly benefited agriculture and consumers.

Ernest R. Sears

For pioneering work in wheat genetics and for discoveries on chromosomal mechanisms that established standards in animal, plant, and human genetics.

Orville A. Vogel

For development of the first useful semidwarf wheats and of innovative production systems that made the Pacific Northwest a major source of soft white wheat, inspired similar research efforts throughout the world, and sparked the Green Revolution.

Cecil H. Wadleigh

For elucidating the mechanisms through which crops respond to salinity and water stress and for inspired planning and leadership that enabled and motivated those who worked with him to expand and make use of knowledge of soils, water, and air and their interactions with plants.

1988

Francis E. Clark

For outstanding research leading to greater understanding of soil, plant, and microbial interactions and of nutrient cycling in terrestrial ecosystems.

Edgar E. Hartwig

For research in soybean breeding and genetics that has been a major factor in soybeans becoming the second most valuable U.S. crop and particularly for developing cultivars that thrive in the South.

Ralph E. Hodgson

For significant contributions to the knowledge of ruminant nutrition and for visionary leadership, both domestic and international, in the animal industries.

Hamish N. Munro

For career-long contributions to the science of nutrition, particularly on the relationship of dietary protein and iron to the health of the elderly, and for promotion of studies on aging.

Jose Vicente-Chandler

For research leading to new and greatly improved production systems for beef, milk, coffee, plantains, and rice for Puerto Rico and Caribbean countries.

1989

Douglas R. Dewey

For world leadership in genetics and taxonomy of the Triticeae tribe of grasses and for development of the cytogenetic basis for creating new grass hybrids.

Theodor O. Diener

For conceptualizing and discovering viroids, for leading research on viroid detection and control, and for inspiring new approaches in the search for causes of several serious diseases affecting plants, livestock, and humans.

Karl H. Norris

For developing principles and instruments using the electromagnetic wave spectrum to make rapid nondestructive measurements for evaluating quality of agricultural products.

John F. Sullivan

For engineering contributions to the food-processing and preservation industries, including development of instant potato flakes and of batch and continuous-explosion puffing.

1990

Theodore C. Byerly

For extraordinary contributions as a scientist, research leader, and administrator to the success of agricultural research programs and advances in U.S. and world agriculture.

Gordon E. Dickerson

For research contributions widely used by breeders to increase production efficiency of cattle, sheep, swine, and poultry.

Robert W. Holley

For isolation and characterization, including the first nucleotide sequence, of transfer ribonucleic acid (tRNA).

Virgil A. Johnson

For outstanding contributions to development of superior bread wheat cultivars and of improved wheat germplasm and for vigorous promotion of national and international cooperation among wheat breeders.

George F. Sprague

For outstanding contributions to effective methods of hybrid corn breeding and germplasm improvement.

1991

John H. Weinberger

For outstanding lifelong contributions in development of fruit varieties and fruit-breeding technology.

Walter H. Wischmeier

For developing the Universal Soil Loss Equation, which has been widely used for three decades worldwide in conservation and management of our natural resources.

1992

Raymond C. Bushland

For pioneering research leading to screwworm eradication by the sterile insect technique and for research leading to control of typhus vectors.

Lyman B. Crittenden

For significant contributions to retroviral genetics, transgenic animal development, and genome mapping in poultry.

Arnel R. Hallauer

For increasing understanding and use of quantitative genetics in plant breeding, which has led to development of many superior corn hybrids worldwide.

1993

John R. Gorham

For scientific leadership and studies that have resulted in solutions of disease control problems and have advanced the basic knowledge of viral and genetic diseases in humans and animals.

Sterling B. Hendricks (posthumous award)

For significant contributions as a chemist, physicist, mathematician, plant physiologist, geologist, and mineralogist.

Clair E. Terrill

For scientific contributions and worldwide leadership in sheep production research.

1994

Charles N. Bollich

In recognition of superlative accomplishments in rice breeding and genetics and their consequent benefits to American agriculture.

Chester G. McWhorter

For outstanding contributions to American agriculture through basic and applied research that has resulted in improved weed-management technology, increased yields, and reduced cost of production.

Malcolm J. Thompson

*For career research contributions in the field of
insect and plant steroid biochemistry.*

1995

Harry Alfred Borthwick

*In recognition of contributions in elucidating the importance of
photoperiodic mechanisms controlling flowering in plants.*

William M. Doane

*For initiating, leading, and conducting research that created new
and useful products and led to the establishment of new
industries based on agricultural raw materials.*

Walter Mertz, M.D.

*For contributions and leadership in elucidating the importance to
health of several trace elements and promoting research on
dietary risk factors for chronic disorders.*

1996

Fred W. Blaisdell

*For pioneering research and development of improved
structures for soil and water conservation.*

Herbert J. Dutton

*For pioneering research leading to the establishment of soybean oil
as the predominant edible vegetable oil in the world.*

Charles Jackson Hearn

*For developing improved orange, grapefruit, and tangerine
varieties used extensively by U.S. citrus producers
to replace trees killed by the 1980 freezes and
to expand the citrus acreage.*

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